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ABSTRACT

Students who work at the Exploratorium in San Francisco, California learn about science by explaining to the visitors from all over the world how the museum's exhibits work. The students are teen-agers who also come from all over the world to be "Explainers" for the Exploratorium. They go through a training period to learn the basics of how the exhibits work and how to share their knowledge with the general public. The student "Explainers" not only learn about science, but they also learn how to be effective communicators. After completing a semester of working in the Museum, students take their experiences with them and build upon them for the rest of their lives. Many students use this valuable experience to further their science education and to pursue science related employment. The book concludes with information on how students can apply to work at the Exploratorium. (JAG)

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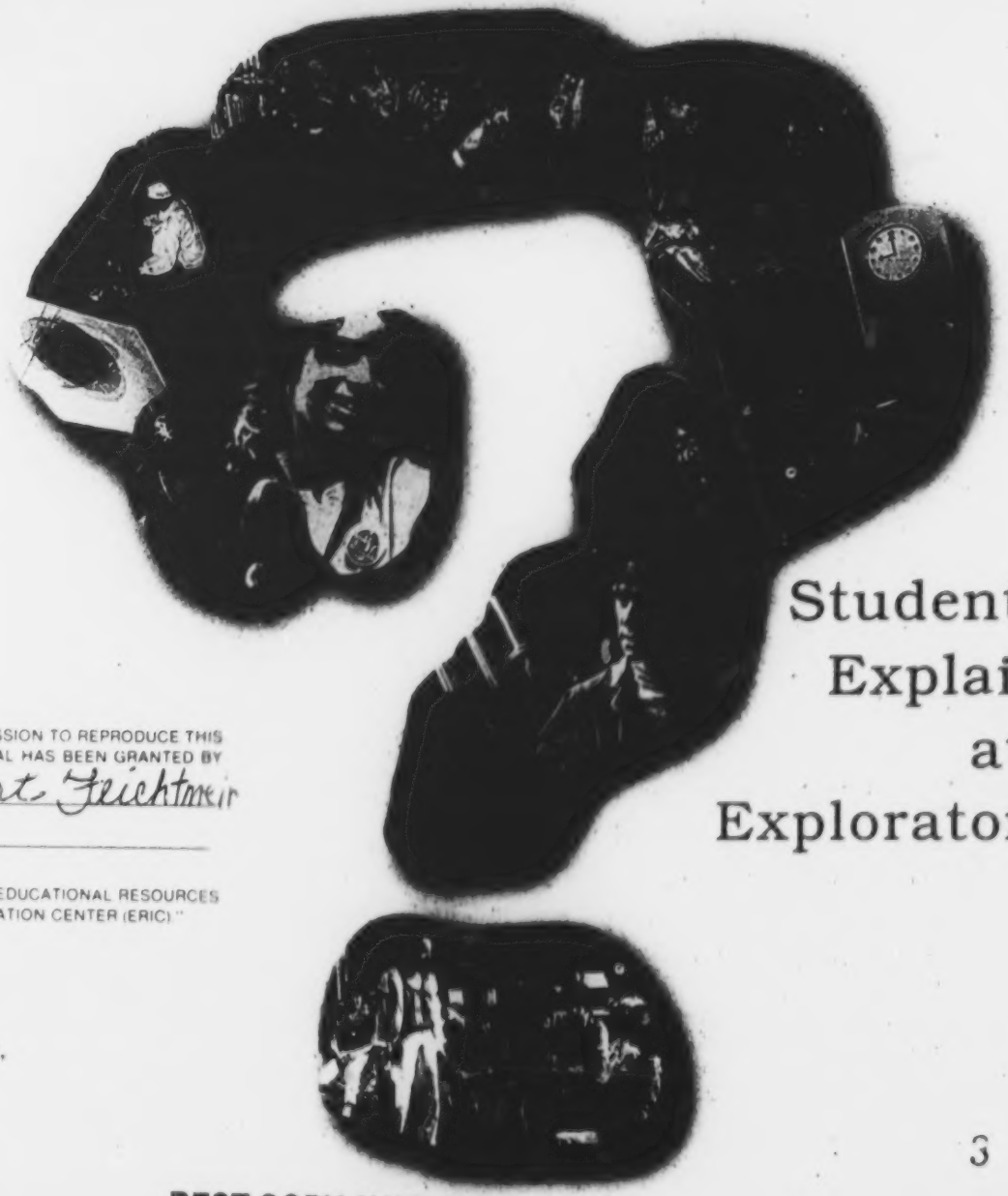
WHEN THE RIGHT ANSWER IS A QUESTION



Students as Explainers at the Exploratorium

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by Ellen Klages

with Darlene Librero and Jamie Bell,
Explainer Program Developers

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Introduction

For the last twenty-five years, the Exploratorium's exhibit floor has been staffed by Explainers—high school students who learn about science as they learn to use the exhibits. As they assist visitors in their explorations, these students gain an understanding of their own learning process and their interactions with others.

We believe that museums have an important role in developing the lives of the young people in their communities, and we believe that the Explainer program serves that role in the San Francisco Bay Area. This publication provides an overview of the Explainer program, its structure, and its function for both the students and the museum. It is not intended to be a manual or a how-to book, but rather an outline of our procedures and philosophy. We hope other museums will be able to use our experiences as a springboard for developing their own programs.

This book is part of a larger project funded by YouthALIVE!, A National Initiative of the DeWitt Wallace–Reader's Digest Fund. In it we hope we have brought to life the insight, the feeling of community, and the pleasure that we have shared with more than 1800 Explainers over the years.

Darlene Librero, Director, Explainer program
Jamie Bell, Manager, Explainer program

In a residential neighborhood near the Golden Gate Bridge, the Rotunda of the Palace of Fine Arts reigns over a peaceful lagoon. Behind the Rotunda, a relic of the 1915 Panama-Pacific International Exposition, is a cavernous space filled with flashing lights, machines that buzz and whir, and a constant hum of excited conversation. It is the Exploratorium, San Francisco's world-renowned museum of science, art, and human perception.

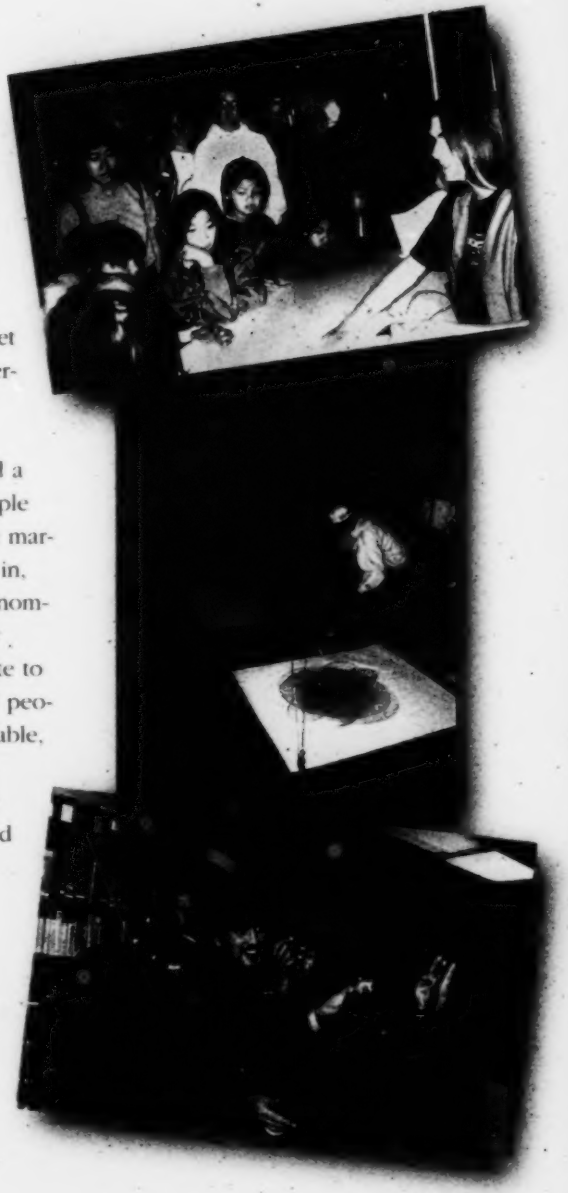
The 62,000 square feet of the museum's exhibit floor holds over 650 hands-on interactive exhibits covering topics from optical illusions to the electromagnetic spectrum, human genetics to soap bubbles. The exhibits are roughly divided into areas—Sound and Hearing, Electricity, Life Sciences, and so on—but there are no guided tours or set order to a visitor's experience. Each person structures an individual journey according to his or her own interests.

Like the exhibits, the Exploratorium's only guides are also scattered throughout the museum. More than two dozen teenagers in bright orange vests stroll the exhibit floor, mingling with visitors and helping them to find their way through this sometimes bewildering array of bells and whistles, mirrors and microscopes. They are the Explainers.

When physicist Frank Oppenheimer founded the Exploratorium in 1969, it was one of a very small handful of museums experimenting with a new way of sharing information with the public. In the old model of the science museum, visitors looked at displays of artifacts and instruments, and read the signs to decipher what was in the glass cases. But at the Exploratorium and other new museums, exhibits were taken out from behind glass and set up so that visitors could interact and play with them.

Frank Oppenheimer had a vision of a place where people could come and explore the marvels of the world they lived in, through exposure to its phenomena. The mission of his new museum was to communicate to visitors that both nature and people are not only understandable, but exciting. He wanted to build a place where science was fun, not threatening, and where the complexities of science and technology could be explored.

The whole idea was to create a place that is comfortable for the nonscientist, to show scientific



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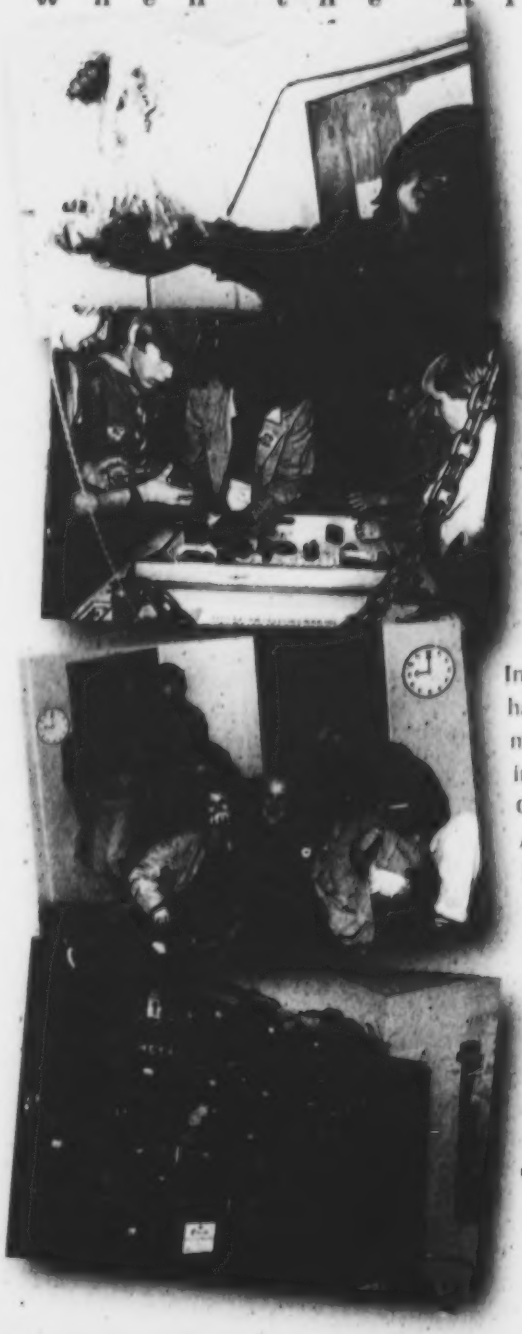

principles in the context of everyday life. Because of this, he didn't want to staff the floor with scientists who would tell visitors the "right" answers. He wanted guides who would encourage visitors to play, and to discover their own questions and answers.

In the mid-sixties, Frank had visited most of the major science museums in Europe while on a Guggenheim Fellowship. At the Palais de la Découverte in Paris, he had noticed that the exhibit area came to life during the tours and demonstrations led by high school and college students. He liked the idea of using young students, not just to conduct demonstrations of specific exhibits, but to be the liaisons between the public and the whole museum. When the Exploratorium opened in 1969, there were half a dozen exhibits and one teenage girl who helped visitors figure them out. Twenty-five years later, more than 1800 young people have served as Exploratorium Explainers, helping to create an atmosphere of playful interaction.

"Explaining" can involve anything from an in-depth discussion of scientific phenomena to showing a child which button to push. The Explainers' primary job is to help visitors use and understand the Exploratorium's exhibits and the principles behind them. On a typical day, an Explainer will spend four to seven hours out on the floor playing with the exhibits, and approaching visitors to offer suggestions, assistance, or explanations. As one staff member put it:

We don't have scientists in white lab coats. Instead you may meet a high school kid with a mohawk. He won't be an imposing scientist, but he'll probably get you to play around with the exhibits, encourage you to unwind your thoughts and explore.

The philosophy of the Explainer program extends the mission of the museum as a whole. Through inquiry and exploration, students can witness and understand their own learning process. They are introduced to broad concepts in a range of scientific disciplines, and they learn to relate those concepts to the world around them. As they develop an interest in their own educational process, they are able to use their experiences to teach others in the same way.

Since 1969, museums and technology centers around the world have adopted the

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Explainer program as a model for their own floor staff. At the Espaço Ciência Viva, a small science center in a working-class district of Rio de Janeiro, Brazil, student guides are called Monitors. Animateurs assist visitors at the Cité des Sciences et de l'Industrie, la Villette, in Paris. In Caracas, Venezuela's Museo de Los Niños they are Amigos, and at the Exploratory in Bristol, England, youthful Pilots help visitors navigate the museum floor.

Structure of the Program

The Exploratorium's Explainers are not docents or volunteers; being an Explainer is a paid position at the museum. Each year, three separate groups of Explainers are hired for a four-month period—two during each school-year semester, and one over the summer. The spring and fall groups have 25 students; the summer group has 35 to 45, to handle larger seasonal crowds.

Explainers range in age from 14 to 21; the actual range changes from group to group, but the majority of students are 15 to 18 years old (high school juniors and seniors). Explainer program Director Darlene Librero says the age mix is important because it gives younger and older students

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"The job seems difficult, but it also seems like it will be very rewarding. I think I'm going to learn a lot."

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the chance to learn with and from each other—an opportunity that is often missing in a school situation.

Explainers arrange their class schedules so they can work at the museum during weekday afternoons, Wednesday nights (when the Exploratorium has extended hours), and all day Saturdays and Sundays. During the school year, the average work week is twelve hours, but many summer Explainers work 30- to 40-hour weeks.

For many, if not most students, being an Explainer is a first job. While the pay is minimum wage, it is quite a different experience from most entry-level jobs. Unlike fast-food restaurants and convenience stores, the Exploratorium provides a work atmosphere with a high level of responsibility and independence.

Paying the Explainers is an important aspect of the program. In American society, having a job comes with certain expectations that being a student does not. It is a symbol of being able to handle responsibility, and it brings with it a degree of social prestige, in addition to income. Past Explainers have agreed that their attitudes about both working and learning were different when the person giving them instructions was their boss, not a classroom teacher.

Recruiting Explainers

A few weeks before the end of each four-month Explainer session, Program Director Darlene Librero and Program Manager Jamie Bell begin the process of recruiting a new group of students. On May 1, September 1, and January 1, they send out over a hundred letters to teachers in both public and private schools, and to administrators of community organizations that work with Bay Area teenagers.

The letters include information about the Explainer program and about the museum, and a description of what the job entails. Teachers are asked

to recommend students who might be interested in working at the Exploratorium, or who might benefit from becoming Explainers. (See Appendix for sample letter.)

One of the unique aspects of the Explainer program at the Exploratorium is that teachers are asked to encourage a variety of students to apply. Many museums have programs geared to students who already have an interest in science, or who have excelled in high school science classes. But the purpose of the Explainer program, says Exploratorium Museum Liaison Sally Duensing,

. . . is not to recruit future scientists of the world, but more to give students exposure to what it's like working with people. Teaching and communicating with others really turns them on to their own learning and opens them up. When that happens, it's really great.

Students are recruited from all over the five-county metropolitan area that the museum serves. Some students who apply are recommended by teachers or group leaders. Others have heard about the Explainer program from friends and classmates, or have visited the Exploratorium and seen the orange-vested teens on the floor. Still others have had brothers and sisters who have been Explainers in previous years. The program is as old as the museum, and each semester many applications come in simply because of word of mouth.

"As an Explainer, I get to meet and work with people from all over the globe, and learn from their different cultures."

Recruiting for the summer session is even more extensive, because students from all over the world, not just the Bay Area, are encouraged to participate in the program. It's a very popular program. Said one Explainer:

The American kids love it because it's so cosmopolitan, and the kids from other places love it because they get to compare notes about schools and social life here and there.

Interviewing Potential Explainers

The Explainer application process is simple; Darlene and Jamie try to keep the process as personal as possible. There are no application forms or essays to complete before an interview is granted. The letter merely instructs students to call the museum office and set up a half-hour appointment; sixty to one hundred students are interviewed during a one-week period.

The first half of each interview, says Darlene, is just a conversation with the student: what she's interested in, what she's taking in school, why this job sounds interesting, what her family life is like, whether she has any specific career or life goals. It's an information-gathering talk, but Darlene says it's also

. . . a way for us to hear them talking, to see how they interact with us and to get a feel for how they would benefit from the program. We ask ourselves: Would this be a big thing in their life? Or is it going to be just one more activity in a busy schedule?

If they don't get this job, will they ever have an opportunity for an experience like this again?

The second part of the interview takes place on the museum floor, where Darlene and Jamie talk about an exhibit with the student. This not only gives the applicant an idea of what is involved in explaining an exhibit, but is an opportunity for Darlene and Jamie to observe how the student reacts to the noisy and chaotic environment of the floor, to the exhibit, and to the process of hands-on learning. Darlene relates:

That's a real crucial part of the interview. Sometimes nothing much happens in the conversation, but you take them out to an exhibit, and you start explaining it: "Here's this and this and blah, blah, blah," and all of a sudden they just open up. It's a whole different dynamic. Some students are quiet back in the office, but get really excited and animated when you get them out on the floor.

And sometimes it's just the opposite. You'll get a boy who's very open and verbal and social, but when you take him to an exhibit, he just looks around. He'll pay attention for a minute or two, but we can tell he's not really engaged with it at all.

Selecting the New Explainers

After a week of interviews, Darlene and Jamie select the students for the next Explainer group. They interview at least twice as many students as there are Explainer openings, and their selection process is intuitive, subjective, and changes from group to group.

The mission of the program is to select a diverse group of students, to reflect the entire community the Exploratorium serves. Each Explainer group is chosen to be as rich a mix of gender, race, culture, experience, and ability as possible. But almost all the students in the mix share a few essential characteristics, which Darlene and Jamie look for in each interview:

- The student is at a point in his life where he is ready for something new. A transition point. A place in his life where

he needs a new channel for his energy.

• The student has a level of curiosity and interest. It doesn't have to be science, but there has to be something that intrigues her and makes her want to learn more.

• The student has a willingness to work with people. Not necessarily experience, but either a natural comfort with people or a desire to develop that part of himself.

Surprisingly for a science museum, an aptitude for science is not a requirement but an "extra added bonus." Jamie explains:

Some of our best Explainers had had almost no science, and some of the weakest ones were very science-literate, but didn't know when to stop and listen.

They had lots of knowledge, but they couldn't communicate it well.

A lot of the selection process is based on past experiences Darlene and Jamie have had with other Explainer groups, and an intuition for who's going be a good Explainer, and who's not. Says Jamie:

You can have a really quiet young girl who's very shy during the interview, but you have a gut sense that she's ready to open up. The Explainer program gives people like that a chance.

The other component being evaluated during the interviews is how each of these various individuals will fit together to make a good Explainer group. The easiest course would be to select two dozen students with solid academic records and good social skills, and train them to work with the public out on the floor. But the leaders of the Explainer program deliberately seek not only a mix of students that will reflect the community at large, but also a mix that will provide a maximum growth experience for each individual within the group.

In addition to a balance between boys and girls, the mix includes the following:

• Age range. In general, older students are more adept at teaching and younger students have more enthusiasm. In a good group, they learn from each others' strengths.

• Multicultural and ethnic diversity. Each group is balanced so that there is a great deal of diversity, but also enough support for each subgroup. Ideally, each Explainer gets to work with people from similar situations and also has the opportunity—and challenge—of

working closely with people who are very different from his friends and family. It broadens his experience of the world, and it usually allows him to uncover the similarities behind what might have seemed like insurmountable differences.

• Socioeconomic diversity. "We want to reach students from underserved neighborhoods—they have fewer opportunities and fewer options. They just don't have the resources available to them, and we can offer them a community where learning is a positive experience," Darlene explains.

• A range of skills, education, and experience. Says Jamie, "We're going to have some students come in who know what responsibility is all about, and we try to balance that with the ones who may not have a clue. It's all about balance—and we go for the mix."

The mix of students in each group is one of the program's strengths, although frequently one of the biggest challenges for its administrators. But from its inception, one of the goals of the program has been to select the people who will benefit the most from their work as Explainers. Darlene elaborates:

We look at what the group needs, but we also look at who needs the group. Sometimes we'll say, "Well, this girl is emotionally confused, so maybe this experience will be good for her." We know what's going to happen—almost every time—by the end of the semester. She'll have new friends. She'll have a support group. She'll have learned that she can participate and that she has something to offer. We never know exactly what's going to spark that change, but we know something will happen.

"The friendships we've made here will last a lifetime."

When an Explainer group is out on the floor, what the public sees is that learning about the world and being an active participant in it is not limited by age or race or gender or environment. At the Exploratorium, at least, it is an opportunity that is open to everyone.

An Explainer Group's First Few Weeks: Pre-training

About a week after the selection process is completed, a new group of Explainers meets at the museum for the first time. Each group includes three or four students from the previous group, who are rehired for a second semester.

There is an overlap of about three weeks at the beginning of a new group and the end of an old group. During that time, the rehired students meet occasionally with their new group, but continue to work their shifts with the old group. Darlene and Jamie leave the experienced old group with minimal supervision while they conduct twelve hours of pretraining with the new Explainers.

The pretraining period is a time for the new Explainers to get to know the exhibits and each other, and for them to observe different styles of teaching. The group meets for two hours on three consecutive Saturday and Sunday mornings. In addition to learning about four areas of the exhibit floor from four different staff instructors, Darlene

says the most important information the students gain in pretraining is this:

Do they like the place? Are they willing to work and to learn? The concepts they explore here should really interest them, but the place is so huge! So the idea is to give them the opportunity to explore it with some guidance, and for Jamie and me to see who we've got this time around, and what kind of work we have ahead of us.

The first morning of pretraining is like any first day of class—everything is new and unfamiliar, and everyone's a little nervous. Darlene and Jamie try to start the group off with a light-hearted, joking few minutes, to put the students at ease. "A lot of the time they just think we're nuts," Darlene says, "but it helps break the ice." After a round of introductions within the group, the new Explainers watch a video called *Palace of Delights*, a film introducing the Exploratorium produced for the TV show "Nova." Watching the film, says Darlene,

. . . gives them a sense of how the museum developed. It also gives them an opportunity to ask some questions about the Exploratorium before we take them out into the thick of it. At the end of the film we talk about the job. We give them an opportunity to think about what they'd like to do, and how they'd like to do it. We have them decide what they think the job should be, instead of us saying "here's this paper that tells you everything you have to do."

Through this discussion, the new Explainers are introduced to the kind of questioning, thinking, and evaluating that will be a large part of their job.

At this stage of the training, Explainers who are completing their semester's work come to talk to the new group, answering questions, and sharing their experiences of the program and the museum. The incoming group is then divided into four smaller groups, each led by Darlene, Jamie, or an experienced Explainer. Each smaller group is given a brief tour of one of four areas of the museum's exhibit floor—Electricity, Light and Color, Waves and Resonance, and Vision—to get a feel for how the exhibits are organized.

"This is the only place in the world where you can learn about science in a comfortable setting, and you can see how to apply it to everyday life."

This tour is an opportunity for the Explainers to view the museum from the perspective of a visitor. There is a lot of just looking and touching. As she explores, however, an Explainer begins to see how the exhibits in a section are related, and how one scientific topic is covered by a wide variety of exhibits. Jamie says:

We don't really expect that they are going to know anything by the end of this part of the training, except which exhibits they like. That's the whole point of pretraining. It gives them some focused time in each area just to look and explore and scope

things out. It gets them to start thinking, even if what they're thinking is, "I have no idea what this means."

A lot of time during the first three weekends is taken up with these brief forays out into the museum. At the end of pretraining, the Explainers are more of a group, and have at least a passing acquaintance with most of the museum floor. As one Explainer put it:

I know something about one area, and not much about another, except I know I've been there and looked at a few things. I know where my locker is, and where the bathrooms are, and where I can get coffee in the morning. I don't know a whole lot about anything else, but that's okay. It's a start.

Besides becoming familiar with the museum and with each other, during pretraining Explainers also begin to do exercises that help them to become more aware. An enormous part of the job of being an Explainer is learning how to "read" people and situations—becoming conscious of what people are doing on the floor, what they might need, and when it's appropriate to step in and offer assistance.

Pretraining offers an opportunity for Explainers to try on different behaviors and modes of interacting—practicing with each other before they step out on the floor to serve the visitors. Some of those behaviors may make a student uncomfortable, especially things generally not done in school or out on the street, like making direct eye contact with strangers, or eavesdropping.

These awareness exercises include some role-playing, some theater games, and some encounter-group-type interactions. They are done during pretraining to take advantage of the fact that the Explainers are not only new to the job but are also strangers to each other. Darlene explains:

First impressions are all they know about each other, and so misconceptions, fears, and stereotypes are high at this time. We confront them with the idea of breaking down barriers—stereotypes about age or class or social and cultural differences. Then we can use the results of what they find out about each other to begin talking about the same issues coming up with visitors. Who do you think these people are? Who do they think you are? What's the best way to approach them?

Through these exercises, the Explainers begin to be aware of other people, and

themselves, in a new way. A black seventeen-year-old acknowledges that a white suburban family might see him as threatening or frightening, and he begins to think about ways he could approach visitors to elicit a friendly response. A Japanese girl explains that in her culture it is not polite to look strangers in the eye, and that the other Explainers need to remember that when they attempt to interact with Asian visitors.

This training in awareness is conducted throughout the semester. But the first exposure to it comes before any in-depth lessons about the content of the exhibits, and many Explainers find that disconcerting. But Darlene and Jamie stress that the most important skill for an Explainer to learn is an awareness of other people, what they're doing, and what they might need. Concrete knowledge of the exhibits is important, too, they tell the group, but if you don't take the time to learn who you're talking to, you can't communicate effectively.

On-the-Job Training

On their fourth weekend, the new Explainer group comes to work for the first time. The old group is gone, and these 23 students are now the only Explainers. They are given name badges and orange vests—the "uniform" of the Explainers, and frequently the only homogeneous element within the group[1]—and sent out onto the museum floor.

The rest of the Explainers' training will be on the job. It's an ongoing process; as Darlene says, "throwing them out there to the wolves is part of the whole learning experience."

This is another unique part of the Exploratorium's program—there is little separation between training and working. Much of it is learning by doing, and a lot of what each Explainer learns comes from the experience of being out on the floor, helping others understand.

During a school semester, most Explainers work twelve hours a week, which is divided into one full weekend day and one weekday. Each workday begins with the Explainers checking in and turning on the exhibits. They also distribute

1. When Frank Oppenheimer hired the first Explainer in 1969, he wanted to outfit her in a way that let visitors know she was an employee, but without an authoritarian connotation—no white lab coat. The interior of the museum was too cool to wear just a T-shirt, so he settled on a bright and highly visible red jacket. For many years Explainers wore these red jackets until fashions changed and more and more visitors were red sweatshirts or jackets. Then the Explainers switched to bright orange jackets. So many Explainers cut their sleeves off—in the interests of fashion or comfort—that Darlene and Jamie finally decided to order sleeveless orange vests instead.

supplies that must be replenished daily—new paper for the Drawing Board, a fresh supply of bubble solution for the Bubble Tray.

All the Explainers working that day gather in their office for a general meeting. Darlene and Jamie tell them about any special events, groups, or activities that will be out on the floor, and give the students a schedule. Each Explainer is assigned to a portion of the exhibit floor, or to a demonstration site. Once the day is mapped out, there is an hour of training—either on the exhibits and scientific phenomena, or on people-oriented skills.

Being an Explainer involves developing a wide range of skills, which include the following:

- General knowledge of scientific principles and specific knowledge of Exploratorium exhibits.
- Being able to articulate and communicate information.
- Being perceptive about visitors' needs.
- Being able to approach visitors with confidence and to initiate conversations.

Few Explainers bring all of these skills to the job, but within the group there are individuals with strengths in each of these areas. During the semester, Darlene, Jamie, and other Exploratorium staff members conduct ongoing trainings to help students develop these skills, and encourage them to learn from and help each other.

Content Training

Knowledge about the exhibits and the science behind them is perhaps the most visible part of the Explainer's job. During their four-month tenure, each Explainer group receives approximately 60 hours of exhibit content training from visiting lecturers and members of the museum staff—including physicists, biologists, exhibit builders, teachers, and artists-in-residence—many of whom are on the faculties of local universities.

"At first, I thought it was just going to be another job, but after talking to the old Explainers, I realized that it seems a lot more interesting. I'm excited!"

The instruction is in small groups, sometimes even one-on-one, and almost all of it takes place on the exhibit floor. Instead of lectures in a classroom, students learn about electric currents while working with a generator and a voltmeter, and about optics by manipulating different lenses and images. Judy Chang, a 1993 Explainer, said:

I learned science from a new perspective. It wasn't traditional teaching. I learned from trial and error. It was fun. It was okay to make a mistake, or not know something, because everyone else was learning, too.

The Explainers benefit from the instruction, but so do the teachers. Senior staff scientist Thomas Humphrey relates that

. . . the Explainers taught me a lot about teaching. When I first came here, I was a new Ph.D., and it was immediately clear that the academic language I

was used to wasn't going to work here at all. I was looking into these glazed eyes, and no one was understanding a word I said. I was in big trouble.

They taught me to think really deeply about just what it was I was trying to teach. Because if I really understand it, I should be able to share that with anybody, at any level.

There are more than 650 exhibits on the floor of the Exploratorium, and no Explainer or group of Explainers learns them all. The students are introduced to all the areas of the museum, and the basic concepts for each exhibit section are discussed, but after the initial orientation, much of the content training differs from one Explainer group to the next, tailored to their particular needs and interests. The instruction starts where their questions begin. There is no set curriculum, no textbook or manual. Darlene elaborates:

A textbook would put limits on the depth and breadth of learning. It's not how much these students know, but the way they're learning it. When we let them lead, they often go far beyond what we would have thought of teaching them.

The exhibits themselves provide enough structure—and enough freedom—for the staff to be able to cover almost any scientific topic or question that comes up.

Like almost everything at the Exploratorium, the Explainer training is inquiry-based. The specific topics and concepts covered, in what order, and even who teaches them emerge from what each group of Explainers has to offer, overcome, or develop. Says Darlene:

At some point, the training takes off from the student's own interests, and you don't have to create a curriculum. It's right there. The beauty of this approach is that you're talking about topics they're already interested in. And they know that you've been listening to them and you're responding, not just feeding them what you think they should know.

Through months of content training, the Explainers come to know many of the individual exhibits. But more importantly, they begin to see the interconnectedness. They start to put ideas together, and relate different exhibits to each other. When that happens, most Explainers will spend a lot of time exploring exhibits on their own, individually or in small groups.

They discuss exhibits—or concepts, or phenomena—around the table in the Explainer office, teaching and arguing with each other. They dissect and refine their ideas, consulting staff

"I loved it. I was really shy before I went into it, but it gave me the confidence to go up to just about anybody and say, 'Hey, how's it going?'"

members when they get stuck. A big part of the training is discovering all the resources the museum has to offer, and they learn to consult the exhibits, the library, and the staff for answers and explanations. Staff physicist Paul

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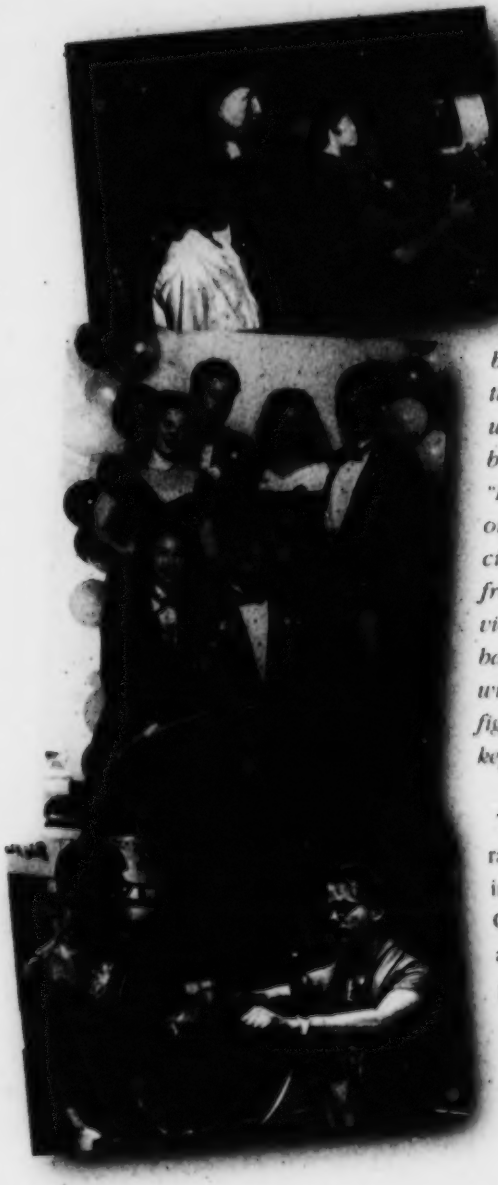


Doherty remembers this incident:

One group came to me and said "We figured out why balls bounce, but we don't like the answer." I said, "So why do you think balls bounce?" One girl said "Because the floor pushes on them." And that's precisely the right answer, from a physicist's point of view. But they wanted the ball to have something to do with it. I loved it that they figured it out, but they still kept questioning.

That is the crux of the Exploratorium's philosophy of learning—asking questions. Liana Crouch, a former Explainer and now an assistant in the program comments:

Being an Explainer made me appreciate people for the first time. And it definitely changed my attitude, not only towards people, but towards learning and science both. I realized for the first time that science had something to do with life. It isn't foreign. I came to see it as a model for the world and how the world works every single day. Suddenly, it was real. It was important.

It is that process of exploring and questioning—What does that do? Why does that happen?—that Explainers try to pass on to visitors. Their job is to facilitate interaction with the exhibits, and to get the visitors to think about what they're seeing—not to provide the "right" answer.

Working with People

Learning about the exhibitry is only one component of an Explainer's training. The rest is learning how to share that information with the public. On mornings when there are no content sessions scheduled, Darlene and Jamie work with the Explainers in exercises designed to develop ways for them to teach and present ideas.

The actual questions and exhibits an Explainer may need to discuss vary from day to day, visitor to visitor. The interactions involved in approaching a visitor and engaging in a conversation also vary from person to person, but there are some underlying social skills that Explainers need in almost any situation.

Approaching a total stranger is difficult for most people. For a teenager, approaching a strange adult is even harder. When the differences in gender, culture, and social background are added in, the situation becomes very complex.

For the first few shifts on the floor, most Explainers spend their

time exploring the exhibits, alone or in groups of two or three, talking to each other. They answer questions from visitors when asked, "Can you tell me where the restrooms are? Is there a lost and found?" but only the most outgoing Explainers initiate conversations at first. Darlene says:

A lot of visitors aren't quite sure what the Explainers do, and the students aren't quite sure about how to go up to them and talk without being rejected. It's a haphazard way of making contact, and there are a lot of different ways to do it. We try to give them a range of roles, and hope they'll find one that feels comfortable.

A typical Explainer group spans the range from students who are totally at ease socially to those who are shy and withdrawn, or even apprehensive about dealing with strangers.

The first steps in developing social skills are taken during pretraining, as the Explainers work to become more aware of their perceptions of themselves and of each other. This awareness is continued during the semester-long training, through role-playing exercises using exhibits and feedback from actual experiences on the floor.

One of the exercises the Explainers do is designed to make them aware of body language—their own and others'—and how it affects their perceptions of an interaction. Two students—one playing the role of an Explainer, one the role of the visitor— might stage an interaction in which the "Explainer" observes the "visitor" and tries to engage him in a conversation. After the exercise, the participants discuss their perceptions of the situation, what worked, and what didn't, assisted by feedback from the group.

Other exercises involve conversations in which the "visitor" acts very interested, or very bored, and the "Explainer" adapts what she's saying to try to make better contact. Participants get the opportunity to discuss what clues give an indication of what the other person was feeling. The "Explainer" gets to verbalize how it felt to be ignored, or how it felt to have someone paying close attention to what she was saying.

Questions that arise from these exercises include the following:

- How close do you have to come up to someone looking at an exhibit before they notice you?

- Is it okay to touch someone to get their

attention? Can you touch them while you're talking to them?

• How fast do you walk through the floor? Are you approachable?

• If you're playing with an exhibit and someone comes up to see what you're doing, do you 1) let them play and leave immediately? 2) let them play and stand by to watch, then offer help? 3) Let them play and try to tell them what's happening?

These exercises are interspersed with sessions watching visitors out on the floor. Darlene and Jamie may tell an Explainer to watch a person, and then ask "What do you think's going on? Are their eyes and their body saying it's okay to come closer? How would you go up and talk to them?" Or the group will observe a couple at an exhibit and be asked "Which one of them would you try to talk to first?"

This kind of training is ongoing, and provides a kind of continuous feedback loop. An Explainer might participate in an exercise in the morning, then put what she'd learned into practice on the floor that afternoon. The loop also works in the other direction. As the Explainers gain more experience interacting with visitors on the floor, the morning role-playing tends to recreate actual situations. Explainers get the chance to share an encounter, reprise it with a slightly different approach or different outcome, and experiment with social variables.

"It was a really cool experience. It was a job, but it meant something."

Other exercises involve the content of the exhibits, with the emphasis on how the information is being delivered. Darlene and Jamie will walk up to an exhibit and say, "Okay, your turn. Choose something about this. Talk about it. Get us interested." It's sometimes an unnerving experience, especially for a new Explainer. But Jamie points out:

Sometimes learning the exhibits requires a real leap. You have to put yourself in a situation where you don't know all the answers. You sweat, but as you do it, you figure out what you do know, and where the gaps are. That's a big part of learning. You need to know where the gaps are before you can begin to fill them.

Each Explainer will get a turn in the spotlight—or the hot seat. The group listens to the Explainer's talk, then offers feedback. Was the tone conversational, or did it sound like a lecture? Was the presentation clear, or did it ramble from topic to topic? Did the Explainer make eye contact, or look down at the exhibit the whole time? Darlene says she can see the difference in an Explainer's whole approach after a few exercises, and that

. . . it helps to have them present things just to us, so they can say to themselves, "Hey, I did it okay in front of them, so I must know what I'm doing." Each time they practice, they feel a little more confident about talking to visitors.

In the course of a day, an Explainer may interact with dozens of people—from other Explainers to staff members to visitors. For most Explainers, social interactions become more fluid and relaxed, and communication

skills often improve dramatically. The combination of exercises and socializing within the group and experience on the floor helps Explainers develop a sense of confidence in what they're doing, and a sense of support—they're not doing it alone. As 1974 Explainer Michael Johnson, now a radio producer, remembers:

the Exploratorium was at the root of it all. It provided the intuitive understanding of so many things. And it did it in a playful way that made the learning joyful and long lasting, as long lasting as some of the friendships that continue to this day. What can I say? How many times in a young life do you get to interpret the Jupiter Fly-By to the Vienna Boys Chorus? I did.

Explainers on the Floor

After an hour to an hour-and-a-half of training and meeting together as a group, the Explainers go out onto the floor to work their individual shifts. Darlene and Jamie draw up a schedule for each shift so that every area of the museum floor is covered by at least one Explainer, and so the Explainers get a chance to work in all the different areas. During their shifts, Explainers are responsible for directing visitors around the museum or to the rest rooms, and so on, and keeping an eye on the exhibit floor and reporting any maintenance or repair needs. In addition to floor assignments, some Explainers are scheduled to work the demonstration sites, including a laser, and Sound, Electricity, and Vision presentations.

Demonstrations are small-group interactions and are more formal and structured than floor assignments. At the Drawing Board, for instance, visitors can sign up to create their own works of art. The Explainer puts a sheet of paper on a hanging platform which swings like a pendulum, and asks the visitor to set the platform in motion. Once the platform is moving, the Explainer lowers a colored marker which traces the intricate pattern of the platform's motion. The visitor experiences the action of a pendulum and takes home a visible reminder.

Another very popular demonstration is the Cow's Eye Dissection. Eight to ten people can sit around a table on the museum floor and watch as an Explainer dissects a cow's eye. The Explainer describes each part of the eye as she takes it apart, lets the visitors touch the lens, and engages in a discussion about how eyes—both cow and human—work. This hands-on anatomy lesson frequently draws a large crowd as visitors roaming through the museum stop to watch.

Demonstrations offer an opportunity to do a different kind of explaining. Although there is no set speech or memorized patter and each group of visitors asks different questions, the flow of the demonstration is similar from one day to the next. Explainers with a flair for presentation often enjoy the more structured audience-participation nature of the demonstrations. Staff physicist Paul Doherty has observed:

Some of the Explainers are like carnival barkers, and they really put on a great show. The visitors love it. These Explainers have a lot of stage presence and after they've been doing it for a few weeks, they've got a good amount of the science down, too. The show gets better and better.

The Explainers who are not assigned to demonstrations go to

the section of the museum they're scheduled to cover that day. Unlike many jobs for teenagers, Explainers are not tightly supervised during their shift, and the schedule is more of an outline than a rigidly adhered-to structure.

Just as there is no set path for a visitor to follow through the museum, there are no set "stations" for Explainers during their shifts. The students are assigned to a general area of the floor, and encouraged to roam around and explore the exhibits within it. While they explore, they keep an eye out for visitors, helping them with their own explorations.

Darlene and Jamie believe that a more structured assignment would limit what the Explainer learned during a shift. By roaming around, Explainers discover interconnections between exhibits and the underlying phenomena, which deepens their understanding and fosters creative thinking and further inquiry. All of this can be passed on to enrich the visitor's experience and ensure that each trip to the Exploratorium is a unique adventure.

While the Explainers are on the floor, Darlene and Jamie do periodic walk-throughs to make sure demonstrations are going smoothly, that all the exhibit areas are covered, and to encourage their students to interact with visitors as much as possible. Jamie says:

We put someone in a section, and then after a while they move to another area, because they're bored, or because they don't feel like they know the exhibits well enough, or because they just need to wander around. We allow for a certain amount of that. The only thing we ask is if we walk out onto the floor, we want to see a distribution of Explainers in orange vests. It doesn't matter if the one who's supposed to be in Sound is over in Light, as long as they're distributed pretty evenly.

Even when Explainers aren't interacting directly with visitors, they are explaining by example. If an Explainer is really engaged in an exhibit, a visitor will frequently come over to watch, because it looks like fun. At that point, the Explainer can turn over the exhibit to the visitor and move on or, if he senses that the visitor might like some assistance, he might stay and watch. Sometimes the visitor will ask questions; other times the Explainer volunteers information. Part of the job is just being a role

model for visitors. As Paul Doherty puts it:

Explainers may not be the right name. I think of them as shills. Their job is to play with the exhibit so that it sends out the signal "Hey, try this! Wow! Look at this!" to anyone around them.

It's an odd, unstructured work situation. But the program, as far as Darlene and Jamie are concerned, is meant to teach the students about responsibility and integrity as much as it is to teach them about science and communicating. Darlene says:

We want them to be their own evaluators. If they goof off every once in a while, we just let it go. If it happens over and over, then something's up with that Explainer, something's not right in his life, and it's our job to try and help him get through it.

Dealing with Problems

Explaining is a very flexible job. The rules are few, and the dress code is very loose (wear an orange vest; no T-shirts with offensive language), which creates a very relaxed work atmosphere. It is possible for an Explainer to stroll through the museum, stop and chat with a friend, play with an exhibit, and be entirely within his job description. That flexibility can also makes it difficult to determine what is, or isn't, appropriate behavior.

The most common problem that comes up in each Explainer group is that the floor is not evenly staffed. Sometimes Explainers will clump together, crowding around one exhibit or talking with each other, and sending the message "Yes, we work here, but we're not really working right now." This and most other potential problems are handled by discussion and feedback within the group.

After each shift, the Explainers gather in their office for a fifteen minute to half-hour debriefing about how the day went. Darlene and Jamie give feedback about how well the exhibit floor was covered, and about the interactions they observed during the day. If there were any problems, the group talks about what went on, and gives suggestions on how things might have happened in a different way. Says Darlene:

If something happens on the floor, we bring it to the group. Unless a student brings it up himself, we don't mention any names. We just say "This happened, and here's what he did with it. Here's where it broke down. Here's where the Explainer didn't take responsibility or

dropped the ball. Here's where the visitor was at fault. What else could have happened?"

Having a group of teenagers as the only floor staff and liaison with the public might seem to be a gamble from the point of view of public relations. Some staff members feel that the students—with their eclectic dress and hairstyles—don't really project an appropriate image for a science museum. But most of the staff, and the public, agree that the presence of the Explainers fosters the attitude that science is fun, and that there are very few "rules" for learning and exploring.

Of course, there are occasional problems, usually the result of a mutually bad interaction between a visitor and an Explainer. In one instance, a visitor said something to an Explainer that seemed like a racist remark. The Explainer responded with a rude retort, and the visitor complained to the office.

Rather than disciplining the Explainer, Darlene and Jamie made the problem part of the training. They brought it to the group at the end of the day, and asked them what they thought. A long discussion ensued, in which many Explainers defended the girl's action as justified, and many others condemned it as inappropriate. The conclusion, by group agreement, was that the visitor had been wrong, and the Explainer had every right to be angry, but at the same time, she was being paid to do a job, and part of that meant having to hold her temper.

"It's so liberating to think that my view about the way the world works is important. That's how it is here."

One young man, explaining to Jamie about his pride in the job, said:

The way it makes sense to me is that on top of everything else this museum is, it's a business. People pay good money to come in and be here, and one of the things they get is that we're out here on the floor. So if they're paying for me to talk to them, I feel like I better give them their money's worth.

By discussing problems in the group, the Explainers can learn from each other's mistakes and have the opportunity to define for themselves what is inappropriate behavior. Darlene stresses that this alleviates much of the problem of rebellion against authority common with this age group. Rather than chafing against rules and standards that are imposed on them, the group defines its own rules; following them becomes a matter of group (and individual) pride. She says:

When someone is inappropriate on the floor, we deal with it by telling them, "You're representing yourself, and the other Explainers, and the museum. Whatever image you want people to take away with them is how you should be on the floor." It wouldn't work to give them a list of do's and don'ts. We don't want them to learn to follow orders, we want them to learn to make their own decisions.

For the most part, group process and feedback works very well for handling problems that come up in the course of an Explainer's work day. But Darlene and Jamie also meet with Explainers one-on-one when problems are more personal, or when they need to discuss an individual's job performance and interactions.

"I'm really looking forward to studying Spanish again. Working with people who speak different languages has given me a new appreciation for it."

They are also well aware that sometimes adolescents will act out just to see where the limits are. When they think that's the situation, the scenario can be quite different. Jamie explains that their policy is to

> *. . . sit down and talk about things, and most of the time it's very civilized. But there are times that just doesn't work. Sometimes they only understand anger, because that's what they know. It's unfortunate, and it's certainly not pleasant for us. But occasionally you just have to go off at them, just so they'll know you will. Otherwise, some students will keep pushing, just to see how far you'll let them go.*

Program Leaders

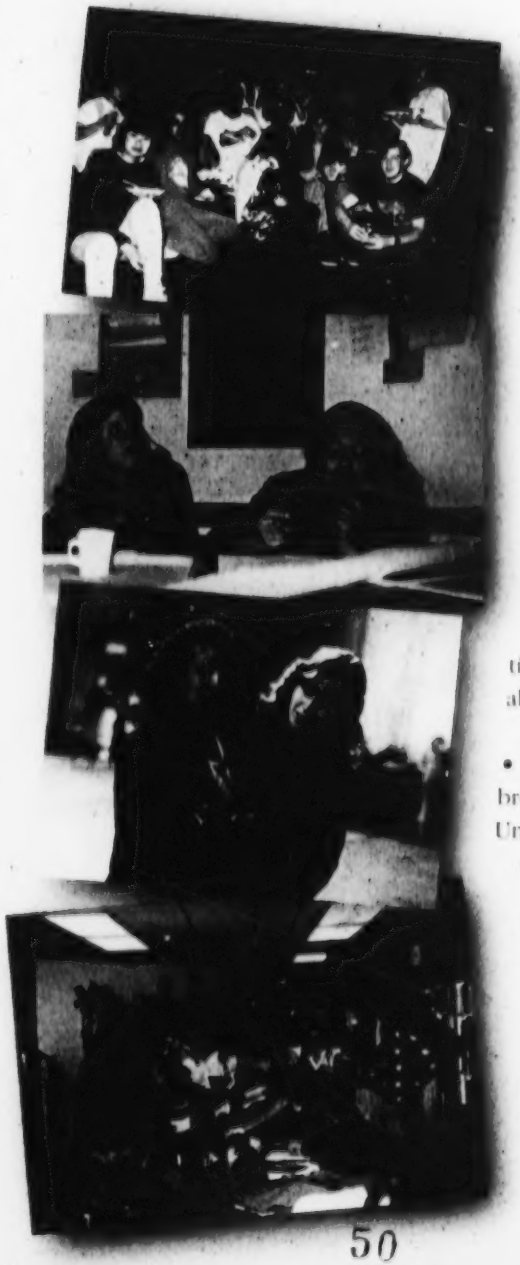
Darlene and Jamie have one of the most difficult jobs at the Exploratorium. They serve as bosses, counselors, friends, and substitute parents to nearly one hundred adolescents each year. Their responsibilities range from making sure someone is covering the Cow's Eye Dissection to reporting to funding agencies on how grant money was spent during the fiscal year. The job is a mix of administration, social work, teaching, and some other almost indefinable components.

Sometimes separately, sometimes together, they run meetings, do interviews, conduct trainings, supervise the staffing of the floor, prepare schedules, sign timesheets, process grievances, and still find time to sit and talk with any Explainer who needs a friendly ear, a shoulder to cry on, or some good advice. For some of these students, Darlene and Jamie are two of the few positive role models in their lives.

Like the Explainer groups they put together, Darlene and Jamie are also a unique mix. She is a woman of color who worked as an Explainer in 1974, stayed on at the museum to help with the program, and eventually became the program's director. Jamie Bell is a white man with a degree in music and experience teaching high school. Neither he nor Darlene had a science background before coming to the Exploratorium, but they have taken classes and workshops—both inside and outside the museum—as part of their own training. Jamie says:

> *I only got really turned on to science here, because of the way it's taught, and all the exhibits. Since I started at the museum, I've gone back and done science teacher trainings and classes I never would have taken when I was in college. It's opened up a whole new world.*

Any science museum that is considering an Explainer-like



program should keep the following points in mind when selecting staff to administer it:

• If you've got more than half a dozen Explainers, you need two full-time people to make the program run smoothly. And those two people have to be able to work with each other without friction. It helps if they're sort of intuitively on the same level about most things.

• Choose people with the broadest possible interests. Unless you're only interested in fostering future scientists, you need to have people who can absorb, or understand, or empathize with any number of different things the students will bring to the program.

• If you want a mix of Explainers, your administrators should be different enough from each other—in terms of gender, ethnicity, and so on—so that most of the students can identify, at least a little, with one or the other.

• An administrator should have good "people skills." As the Explainers' mentor, he or she needs to be able to work with students as a teacher and sometimes as a counselor. At the same time, as the administrator of the program, there is a need to work with the executive staff and other department heads within the museum, and to be a buffer between Explainers and other staff, when necessary. Jamie adds:

The most important thing is that you have to really, truly love young people. You have to want to see the students grow and change and go through that period where every day is a discovery of something new. If you really love that, you'll enjoy the process, and you'll be doing this work for the right reasons.

The Explainer Program and the Museum as a Whole

The Exploratorium is more than a science museum. It is also an internationally known center for innovative science education. The museum is divided into three centers: The Center for Public Exhibition is responsible for the exhibits on the museum floor, special events, performances, and exhibitions. The Center for Media and Communication produces brochures, magazines, books, and multimedia projects that take the message of the Exploratorium far beyond the museum walls. The Center for Teaching and Learning conducts workshops for science teachers

from elementary school through college level, helping them create hands-on science curricula for their own classrooms, and provides outreach programs to under-served neighborhoods.

When the three centers were formed, there was some debate into which area the Explainer program fit best. The Center for Public Exhibition seemed a natural choice, since the Explainers are responsible for monitoring the museum floor and the exhibits. Having the program be separate from the three centers and part of the Human Resources department was also suggested. But it was finally decided that the emphasis of the Explainer program should be on the process of explaining, not the product, and so the program is under the aegis of the Center for Teaching and Learning.

Physically, the area where the Explainers meet each morning and afternoon is in the center of the museum's administrative offices—right in the middle of things. The Explainers meet around a long table in an open area that is flanked on either side by offices. Darlene and Jamie share an office at one end of the space. The Explainer area is often filled with two dozen teenagers, and it's frequently noisy, which can be distracting for other staff members.

A few years ago, plans were made to house the Explainers in a trailer office in another part of the museum, to cut down on the noise level, and to provide a more private space for trainings. But the plan was vetoed, not only by Darlene and Jamie, but also by staff members who didn't want to isolate the Explainers. It may be noisy at times, they said, but it's important for the Explainers to feel that they're an integral part of the museum. As senior scientist Thomas Humphrey put it:

We need to have them around. Otherwise there would be a whole age group not represented on the staff, which is true of most places, I suppose. But as an adult, I get so much out of being around them. Part of it's the energy level. I feel recharged talking to them. And I find out what's happening out in the world, on the street, every time I hang out at that table for five minutes.

So the Explainers stayed in the center of things. Their physical position in the museum reflects their relationship with other members of the Exploratorium staff. Explainers have the opportunity to interact, on a daily basis, with almost everyone else who works in the museum. They work closely with staff scientists, and some of them

also forge working relationships with staff in the machine shop, the computer lab, or the graphics department. But even staff members who don't work directly with the Explainer program become familiar faces.

Benefits of the Program

The Explainer program is successful because it benefits the public, the Exploratorium, and the students in the program. The public is served by the presence of a large and knowledgeable floor staff. Explainers not only provide assistance with the exhibits and information about the concepts behind them, but they also help in more mundane ways, such as giving directions to the bathroom or the cafe, and helping locate lost children.

The biggest benefit to the public is a subliminal one. Museum visitors who live in the Bay Area see people from their own neighborhoods working as Explainers; the Exploratorium is a part of the community. Visitors from other areas have the opportunity to expand their horizons by interacting with people they might not otherwise meet. Families who live outside urban centers come face to face with disadvantaged youth in a non-threatening situation. Visitors from Iowa might forget what the sign on an exhibit said about refraction or cell mitosis in a few days, they'll remember more from a long, pleasant conversation with a young girl in an orange vest who had green hair and a pierced nose.

Just the fact that a teenager is an "authority" at the museum challenges many people's assumptions. Whenever he goes to the Exploratorium, a visitor sees proof that science is not a difficult, esoteric thing, but something that is accessible to everyone.

The Explainer program provides the museum with a large and relatively cost-efficient floor staff, but the benefits for the institution go far beyond employment. The Explainers provide a link to the world outside the museum walls, and a connection between the Exploratorium and all the different communities it serves. Explainers share their experience with their families, friends, and classmates, many of whom then come to the museum as visitors or members, and in turn share their own experiences.

As a center for science education, the Exploratorium is also able to extend its influence into schools and community programs through the Explainers. A goal of the museum is to make science accessible to everyone, and to help teachers create innovative hands-on science activities in their own classrooms. This goal is served not only by contact with teachers in Bay Area school systems during Explainer recruiting, but also by Explainers returning to their schools and sharing what they've learned.

The biggest benefit of the program, however, is what it provides for the young people who participate. In addition to exposure to science and inquiry-based learning, the program provides many of them with a first job experience. Unlike most entry-level jobs, Explaining brings with it not only income, but also a sense of responsibility, and a boost in self-esteem. These students are being taken seriously and treated with respect. For some of them, that is a novel experience in itself. Jeannine Murrary-Roman, a 1994 Explainer, proclaims:

I love this job. I love this job. I love this job. I love this job. I love this job. I love this job. I love this job. There. I said it seven times, so it must be

true. I value the people here as much as the learning opportunity and the paychecks and everything.

A study of more than 700 former Explainers concluded that the experience, although brief, was a major influence in stimulating further education and influencing career choices. During their four-month tenure, Explainers learn from gifted teachers, from each other, and from their own experiences and observations. With each new skill or situation they master, their self-esteem and confidence grow. They learn how to learn by doing the job. They learn by listening, they learn by doing, and they learn by teaching others. These are skills that will benefit them for the rest of their lives, no matter what they decide to do.

The Explainer program is as much about human interactions and getting along with people as it is about science. During their semester as Explainers, students learn firsthand about their own perceptions, stereotypes, racial and cultural differences, and learn to get beyond their first impressions. They learn to get along with other people, and they learn that they are, themselves, valued members of the museum. That, says Jamie, may be the biggest benefit of all.

The thing that really, really matters is the fact that they feel like they're welcome here, and that they're part of this place. The museum is dedicated to helping them grow and to know their own value. And in the end, that kind of attitude is good for everybody—the Explainers, the museum, society as a whole.

Being an Explainer is a very social experience. A student walks into the museum alone, and becomes part of a group. When the new Explainers meet for the first time, they are strangers—from different schools, different neighborhoods, different lifestyles. But by the end of the semester, through training, working, and hanging out together, they have become a kind of family. Louise Bell, a 1994 Explainer, says:

When I first came here and saw all of the other Explainers, I thought this was going to be a long, boring summer. But now I find myself crying because it's over. I'm saying goodbye to friends I may never see again, and wishing I could start all over. I'll never forget the people I've met, or all the things I've learned.

Life After Explaining

After four months as Explainers, the students move on. A few stay for another semester, as part of the new group coming in, but most go back to a regular school schedule, or on to college, or into another job.

For some, life after the Exploratorium is a resumption of what they were doing before, with a lot of new skills. For others, being an Explainer triggers major changes in their lives. Because they have been treated with respect and given responsibility, they may no longer be tolerant of situations in which they're treated any differently. Some have a clearer idea of what they want to do next, and take actions to get there—changing schools, taking a different class schedule.

For many, the Explainer program opens up new views about education, and sparks an enthusiasm for learning. This is one of the goals of the program. As Thomas Humphrey says:

It's not like we want them all to go into science. Some do,

but others who thought science was boring or impossible get to a point where they'll say 'Hey, this isn't so bad. It's actually fun. I still want to be a chef, not a scientist, but I'm glad I got a taste for it.'

But there is a flip side to the kind of learning process Explainers are exposed to at the Exploratorium. Hands-on, inquiry-based, free-form questioning is not a style of education that is practiced in most public—or private—high schools. Several Explainers have come back and told Darlene that they signed up for science classes at their high schools, only to be disappointed and bored by the way the subject was taught.

A stint as an Explainer can also be a "spoiler" for students who go out and get other jobs. Many realize that the level of responsibility, trust, and respect they had at the museum is not duplicated in other entry-level positions. One student came back to visit and complained that:

I didn't know this was such a great job until I got another one. You guys were really cool bosses. You let me use my brain and make my own decisions and you didn't go around saying 'Here are the rules and you follow them and that's that.' Man, I miss this place.

There are many success stories from the Explainer program. Half a dozen senior staff members at the Exploratorium started their careers as Explainers. Some students return as interns, or in other part-time positions in the museum. Others go on to college—students who had never given that a thought before being an Explainer. A few have even gone on to become teachers, engineers, and Ph.D.s in chemistry and physics—the culmination of interests sparked by their time at the Exploratorium.

But most of the students who have been Explainers go back out into the world and go on with their lives. They know a little more about science, and a lot more about people and how to get along. They are more aware of their own abilities and strengths, and most of them have gained confidence and maturity. They have learned skills that they will use throughout their lifetimes—and that is a success story in itself. A 1989 Explainer summed it up nicely:

You ask what we've learned by the end of the semester? We've learned a lot about people. A lot about science, too. But mostly it's people. How to talk with them, how to act with them—and I think I'm going to remember that the rest of my life.

Sample recruiting letter mailed to prospective teachers and school administrators.

August 30, 19—

Dear Teachers/Counselors:

The Exploratorium is about to begin our Fall 19— Explainer semester. We would like to invite three students from your school or agency to apply. Interviews will be held from September 21 through September 25. If you have any students you think might be interested in working as a Explainer, they may begin calling (415) 563-7337 for an appointment starting September 1, 19—.

Enclosed is a short job description, an Exploratorium brochure, and a copy of the most recent issue of the Explainer Program newsletter.

Please post this letter in your classroom or office. If you have any questions about the position, you may call Jamie Bell or Darlene Librero at (415) 561-0342.

Thank you,

James A Bell

Jamie Bell
Manager, Explainer Program

The Exploratorium's Student Explainer Program

Requirements

- Mature high school freshmen; sophomores, juniors, or seniors; college freshmen
- Articulate
- Open to learning new ideas
- Interested in working with people within a museum structure

A background in science is not required.

Job Description

- Act as a museum guide, helper, and pararoller
- Average commitment—two to four months
- Attend scheduled lectures about the museum's exhibits (60 hours)
- Assist staff in museum operation and exhibit maintenance

Pay rate is $4.25 per hour
(including training sessions)

Hours

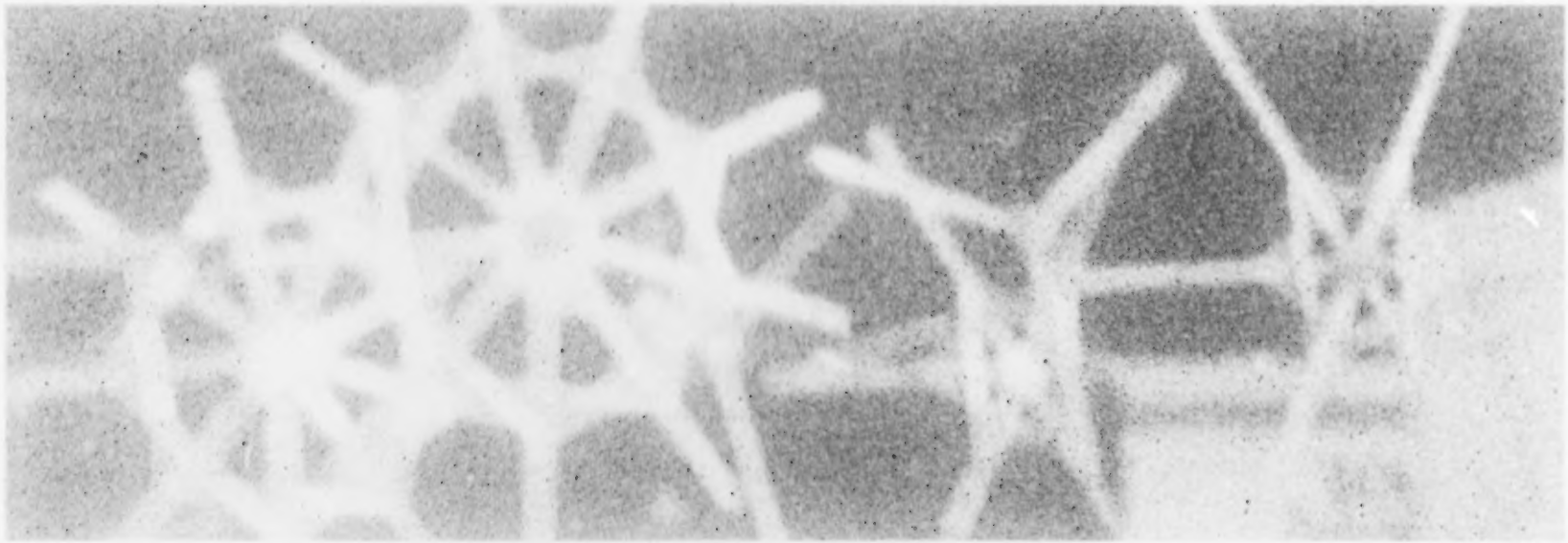
- Available shifts, Spring and Fall semesters:
  2-3 weekday afternoons (1:30-5:30 p.m.) and
  Weekends 9:30 a.m. to 5:30 p.m. or
  Weekends only (9:30 a.m. to 5:30 p.m.)
- Available shifts, Summer semester:
  Saturday through Tuesday, 9:30 a.m. to 5:30 p.m.

To apply, call (415) 563-7337 beginning on the following dates, and make an appointment for an interview:

Spring—January 1
Summer—May 1
Fall—September 1

Be on time for your interview!

The Exploratorium is a nonprofit, equal opportunity museum of science, art and human perception.



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